

COUNTER LIGHT FIXTURE

Background of the Invention

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Field of the Invention

This invention pertains to the field of interior lighting and in particular relates to
light fixtures suitable for mounting under wall hung cabinets for illuminating an underlying
10 counter surface

State of the prior art

15 Counter light fixtures are available in various designs. Continued improvement
remains desirable.

Summary of the Invention

20 The counter light fixture according to this invention has a housing having a housing
top, a front, a rear, a reflector supported under the top and facing an underside of the
housing, one or more lamp sockets supported under the reflector, and a translucent
window panel supported under the reflector and hinged to the housing for movement
between a closed operating condition and an open condition permitting access to the lamp
25 sockets.

The window panel preferably defines a horizontal plane under the reflector and the
window panel is displaceable generally along the horizontal plane between a captive
condition and a released condition. Preferably the window panel is spring loaded into the
30 captive condition and the window panel is released from the captive condition by pressing
the window panel against the spring loading, for example, upwardly against the housing.

The window panel is displaceable between the closed condition and a released condition, and is pivotable between the released condition and the open condition. For example, the window panel may have a rear edge and a front edge, the rear edge being hinged to the housing, and the front edge releasable towards the open condition.

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A detent may be provided for detaining the window panel against slidable movement, and the window panel can be spring loaded into engagement with the detent in the closed condition. The window panel may be released from the detent by pressing the window panel against the spring loading, as by pressing the window panel towards the housing top, and sliding the window panel over the detent.

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A spring arrangement may be provided for urging the window panel away from the housing top thereby to provide ventilation into the housing. Preferably the window panel is supported in spaced relationship to the housing in the closed condition thereby to define a front ventilation slot, a rear ventilation slot or both a front ventilation slot and a rear ventilation slot.

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In one embodiment of the invention the window panel has two opposite sides between its front edge and its rear edge and a front pin and a rear pin on each of the sides, each of the pins being captive in a corresponding slot in the housing, the front pin being slidable in the corresponding slot for freeing the front pin through an open forward end thereof thereby to release the window panel for movement about the rear pin to the open condition. The front pin and the rear pin can be integral with a clip fitted on each side of the window panel, and finger ridges may be defined on each clip.

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A detent may be provided in the corresponding slot for retaining the front pin against sliding movement towards the open forward end in the slot, the detent allowing the front pin to be lifted over the detent and towards the open forward end thereby to free the front pin from the slot. A spring arrangement may be included urging the front pin into engagement with the detent. The spring arrangement may also urge the window panel away from the housing top thereby to admit ventilation therebetween.

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In a presently preferred embodiment the fixture housing has a housing top and a rear compartment of approximately equal length between opposite housing ends. A partition transverse to the housing top may define a switch compartment between the partition and one of the housing ends, and a removable bottom cover is provided for closing the switch compartment with an electrical switch, which may be mounted on the bottom cover. A power transformer in the switch compartment may be connected for converting a line voltage input to a low voltage supply for the lamp sockets.

Electrical wiring in the rear compartment is connected to the lamp socket or sockets through openings in the housing top and the reflector, and the electrical wiring is connected to an electrical power switch, for example, on a removable bottom panel of the housing. Knock out openings may be provided on a back wall of the rear compartment for passing electrical power wiring into the rear compartment. Electrical connectors of male and female gender on the opposite housing ends may be provided for connecting end-to-end one counter light fixture to another counter light fixture. A power cord mateable to one of the male and female electrical connectors can supply electrical power to the lamp sockets.

The counter light fixture may be configured in varying lengths with increasing numbers of lamp sockets. In alternate embodiments the fixture has two or more translucent window panels each supported to the housing under a corresponding reflector and each window panel is independently releasable for movement between a closed operating condition and an open condition permitting access to corresponding lamp sockets.

In a more general aspect of this invention, the light fixture features a housing having a downwardly facing concave top section and an upwardly facing concave rear section, a reflector and lamp sockets supported under the downwardly facing concave top section, electrical wiring in the upwardly facing concave rear section connected for powering lamp bulbs in the lamp sockets, a translucent window panel under the reflector, and a removable top cover for covering the upwardly facing concave rear section to provide a closed wiring compartment which may extend the length of the fixture between opposite ends. In one form of the invention the downwardly facing concave top section

10 **Brief Description of the Drawings**

15 Figure 2 is a front-bottom perspective view of the counter light fixture of Figure 1;

Figure 4 is an elevational cross-section of the light fixture taken along the line 4-4 in Figure 2 showing the window panel displaced for freeing the front pins from their detents by pressing the window panel upwards and forwards to a released condition as indicated by the arrows in the Figure in preparation for lowering the window panel to the open condition of Figure 3;

30 Figure 6 is an elevational cross-section taken as in Figure 5 showing the window panel lowered to its open condition;

Figure 7 is an elevational cross-section taken along line 7-7 in Figure 2 showing electrical wiring passing from the rear compartment to a lamp socket for supplying electrical power to the socket;

5 Figure 8 is an exploded detailed view showing the left side end cap of the fixture of Figure 1 with phantom lines indicating the front and rear slots corresponding to the front and rear pins on the left side of the window panel and also showing the spring support bracket in exploded relationship to the end cap;

10 Figure 9 is a detailed perspective view of the underside of the fixture of Figure 1 showing the switch plate disengaged from the fixture housing to expose the interior of the switch compartment on the right end of the fixture;

15 Figure 10 depicts the mating of end connectors of opposite genders on two fixtures installed end-to-end;

Figure 11 shows a power jumper cable for connecting the end connectors of Figure 10 where the fixtures are spaced apart from each other; and

20 Figure 12 shows the end connectors of a AC power cord by which the light fixture of Figure 1 can be supplied with electrical power from an existing electrical outlet.

Detailed Description of the Preferred Embodiment

25 With reference to the drawings wherein like elements are designated by like numerals, Figs 1, 2 and 3 show a counter light fixture 10 according to this invention, suitable for mounting to the underside of a wall hung cabinet for lighting an underlying counter surface. Counter light fixture 10 has a fixture housing 12 with a housing top 14, a rear compartment 16, and end caps 20 on opposite ends of the housing 12. A reflector 22 is supported under the housing top 14 facing the underside of housing 12. A translucent window panel 28 is supported to housing 12 under reflector 22. One or more lamp sockets 24 are supported on lamp brackets 26 under light reflector 22, and lamp bulbs B,

such as halogen or xenon light bulbs, are inserted in sockets 24. For purposes of explanation and example the drawings show a two lamp fixture, but fixture 10 can be constructed in varying lengths to accommodate different numbers of lamp sockets 24.

5 As seen in the cross sectional views of Fig.s 4 through 7, the housing top 14 includes a top panel 32, a sloping front 34, a drop front 36, and a middle wall 38 which includes a sloping rear 40. The rear compartment 16 shares the middle wall 38 with the housing top 14 and further includes a bottom 42 and a back panel 44.

10 In the presently preferred embodiment the housing top 14 and rear compartment 16 are both part of a single extrusion 40. The housing top 14 can be generally described as a downwardly facing concave portion of the fixture housing 12 and the rear compartment 16 as an upwardly facing concave portion of the fixture housing 12. In other words, the cross sectional shape of extrusion 40 can be understood as being generally S
15 shaped with the S turned ninety degrees clockwise to a horizontal position. The right half of the horizontal S defines the housing top 14 which accommodates reflector 22 and supports window panel 28. The left half of the horizontal S defines a trough extending along the length of the housing 12 between end caps 20 and which serves as rear compartment 16.

20 The open bottom of the housing top 14 is closed by the window panel 28. The open top of rear compartment 16 is covered and closed by a removable top cover 46 press fitted between the top edge 48 of back wall 54 and middle wall 38. The cover 46 is preferably flush or coplanar with top panel 32 of the housing top 14.

25 Light reflector 22 has a reflecting undersurface 48, a first reflector edge 50 captive in a front retaining slot 52 formed on the inside of housing front 36 and a second reflector edge 54 captive in a retaining slot 56 formed along middle wall 38. Reflector 22 can be made by bending resilient thin sheet material such as thin steel so that edges 50, 54 tend
30 to spread apart from each other into corresponding retaining slots 52, 56 by spring force. As a result reflector 22 is supported in elastic compression between the housing front 36 and middle wall 38 of the housing top 14.

The window panel 28 has a rear edge, a front edge 28a and two opposite sides 28c between the front edge and rear edge. On each side 28c window panel 28 has a front pin 60 and a rear pin 62. Each pin 60, 62 is supported in a corresponding front slot 64 and rear slot 66, respectively. Slots 64, 66 are defined in one end cap 20 at one end of reflector 22 as best seen in Fig. 8, and in a transverse partition 68 at the other end of reflector 22 as shown in Fig. 9. Front slots 64 have open forward ends 70. Rear slots 66 permit limited sliding displacement of window panel 28 in a generally horizontal plane as indicated by arrow B in Fig. 4. However, each front slot 64 has a pin detent 72 near its open forward end 70 shaped to hold the front pin 60 against sliding movement through the open end 70. Front pins 60 are released through open ends 70 by lifting the window panel 28 and pins 60 over the pin detents 72 as suggested by arrow A in Fig. 4 in order to free the window panel 28 from its normal closed operating condition of Figs. 2 and 5 to a released condition shown in Fig. 4. Once front pins 60 are released from front slots 64 as in Fig. 4 the window panel 28 is itself released from its closed condition and is free to swing or pivot about the rear pins 62 captive in rear slots 66, allowing the front edge 28a to drop away from the fixture housing 12 to the open condition of the window panel 28. The two rear pins 62 remain captive in their corresponding rear slots 66 such that the rear edge 28b of window panel 28 remains hinged about rear pins 62 to housing 12 for pivotal movement to its open condition. The front pin 60 and rear pin 62 on each side 28c of the window panel 28 can be formed as integral parts of corresponding right and left clips 74 fitted on each end of window panel 28, as best seen in Figs. 2, 3 and 8.

In order to retain the window panel 28 against unintentional release, front pins 60 are spring loaded into a captive condition behind pin detents 72 by two leaf springs 76, 78 pressing down respectively on the left and right ends of the window panel as seen in Figs. 5 and 7. A left spring 76 is fastened to the underside of a left bracket 80, and a right spring 78 is fastened to a right bracket 82. Springs 76, 78 resist lifting of front pins 60 over pin detents 72 and keep the window panel 28 from sliding out of its normal closed operating condition.

The window panel is released from its closed condition by pressing upwardly on the opposite ends of the panel against the resistance of springs 76, 78 to overcome and compress the springs sufficiently to raise the front edge 28a of window panel 28 and lift

front pins 60 over pin detents 72, while at the same time pushing window panel 28 forwardly in slots 64, 66, as suggested by arrows A and B in Fig. 4 until front pins 60 are freed from front slots 64. This task is facilitated by finger ridges 84 formed on the underside of each clip 74, as shown in Fig. 2.

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The spring arrangement 76, 78 urges the front pins 60 into engagement with the corresponding pin detents 72 as just explained and also urges the window panel 28 away from fixture housing 12 thereby to provide ventilation into the fixture housing. The spring arrangement 76, 78 supports window panel 28 in spaced relationship to housing 12 in the closed condition of the window panel thereby to define a front ventilation slot 86 and a rear ventilation slot 88. The ventilation slots 86, 88 allow flow of air into and through the interior space 90 defined between reflector 22 and window panel 28, for example as suggested by arrows C and D in Fig. 5 to facilitate dissipation of heat from the light fixture 10.

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The fixture housing 12 is divided by transverse partition 68 across extrusion 40 as best understood from Fig.s 3 and 9. Reflector 22 is contained between transverse partition 68 and left end cap 20. A switch compartment 92 is defined between partition 68 and right end cap 20. A removable bottom cover 94 closes switch compartment 92 and is secured by a catch 96 which fits over flange 98 and a screw 100 which passes through cover 94 and threads into bracket 102. An electrical power switch 104 is mounted to bottom cover 94 and is connected by electrical wires 106 for turning on and off electrical power to the lamp sockets 24 of the fixture 10.

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Electrical wiring 110 is placed in rear compartment 16 and is connected through switch 104 for supplying and distributing electrical power to the lamp socket or sockets 24 of light fixture 10. The rear compartment 16 provides a conduit for the electrical wiring along the fixture housing 12. One or more pass-through openings 112 each preferably equipped with a protective sleeve 114 are provided in middle wall 38 and in reflector 22 to admit the wiring 110 from the rear compartment 16 to lamp sockets 24 as shown in Fig.s 3, 7 and 9.

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The counter light fixture 10 can be configured for hard wired installation or for self-installation. For hard wired installation, typically done by an electrician, one or more knock out openings (not shown in the drawings) may be provided in a convenient location such as the back wall 44 for passing external electrical power wiring into rear

5 compartment 16. For self-installation, male and female electrical connectors 116, 118 respectively are provided on end caps 20 as shown in Figs. 1, 3, 9 and 10. End connectors 116, 118 may be connected to each other by wiring 110 in rear compartment 16 for passing electrical power through the fixture 10 from one end connector to the other. One or both end connectors 116, 118 are also normally connected for supplying power to
10 lamp sockets 24. Either of connectors 116, 118 can mate to an external power cord 120 equipped with an appropriately configured mating connector 122 and a power plug 124 mateable to an electrical wall outlet, such as shown in Fig. 12 for supplying electrical power to the lamp sockets 24. Each connector 116, 118 can mate to a connector 116, 118 of opposite gender on an adjacent light fixture 10, for connecting end-to-end one
15 counter light fixture 10 to another counter light fixture 10 as depicted in Fig. 10, so that only one of the connected light fixtures 10 requires connection to an external line voltage source.

A jumper cord 126 such as shown in Fig. 11 may be provided with connectors 128,
20 130 of opposite gender for interconnecting end connectors 114, 116 of two spaced apart light fixtures 10, where direct mating of end connectors 114, 116 is not possible because of the spacing.

The counter light fixtures of this invention can be configured for use with either
25 high voltage (e.g. 110 Volts) or low voltage (e.g. 12 Volt) lamp bulbs in lamp sockets 24. For low voltage use a power transformer 132 is provided, which can be conveniently installed in switch compartment 92, as shown in Fig. 13, and connected for converting a line voltage input of the light fixture to a low voltage supply for the lamp sockets 24.

30 In embodiments of light fixture 10 where the number of lamp sockets 24 and corresponding lamp bulbs makes the housing 12 relatively long between end caps 20, it may be convenient to provide two shorter reflectors 22 with two corresponding window panels 28 instead of a single long reflector 22 and window panel 28. In such embodiment

two or more translucent window panels 28 are each supported to a common light fixture housing 12 under a corresponding reflector 22 and each window panel 28 is independently releaseable for movement between a closed operating condition and an open condition permitting access to lamp sockets 24 mounted under the reflectors.

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While a preferred embodiment of the invention has been described and illustrated for purposes of clarity and example it must be understood that many changes, modifications and substitutions will be apparent to those having only ordinary skill in the art without departing from the scope of this invention, which is defined by the following claims.

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What is claimed is

CLAIMS

1. A counter light fixture comprising:

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a fixture housing having a housing top, a front, a rear and opposite ends;

a reflector supported under said top and facing an underside of said housing;

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one or more lamp sockets supported under said reflector; and

a translucent window panel supported under said reflector and hinged to said housing for movement between a closed operating condition and an open condition permitting access to said lamp sockets;

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2. The fixture of Claim 1 wherein said window panel is slidable between said closed condition and a released condition, said window panel being pivotable between said released condition and said open condition.

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